Attachment 2.I

2025 Future Conditions Weave Analyses

HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	NO-BUILD AM PEAK HOUR

Site Information

Freeway/Dir of Travel	EB
Weaving Segment Location	HIGHLAND AVENUE
Analysis Year	2025

Project Description *HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	3		
Weaving segment length, L_S	766ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	50 mph	Freeway maximum capacity, C_{IFL}	1900
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	849	0.92	2	0	1.5	1.2	0.990	1.00	932
V_{RF}	771	0.92	2	0	1.5	1.2	0.990	1.00	846
V_{FR}	550	0.92	2	0	1.5	1.2	0.990	1.00	604
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	932							V =	2382
V_W	1450								
VR	0.609								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1450 lc/h
Interchange density, ID	0.2 int/mi	Weaving lane changes, LC_W	1538 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	29 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1567 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	14

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2382 pc/h	Weaving intensity factor, W	0.398
Weaving segment capacity, c_w	3746 veh/h	Weaving segment speed, S	38.2 mph
Weaving segment v/c ratio	0.630	Average weaving speed, S_W	40.0 mph
Weaving segment density, D	20.8 pc/mi/ln	Average non-weaving speed, S_{NW}	35.7 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9125 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	BUILD AM PEAK HOUR

Site Information

Freeway/Dir of Travel	EB
Weaving Segment Location	HIGHLAND AVENUE
Analysis Year	2025

Project Description *HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	3		
Weaving segment length, L_S	766ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	50 mph	Freeway maximum capacity, C_{IFL}	1900
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	900	0.92	2	0	1.5	1.2	0.990	1.00	988
V_{RF}	900	0.92	2	0	1.5	1.2	0.990	1.00	988
V_{FR}	550	0.92	2	0	1.5	1.2	0.990	1.00	604
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	988							V =	2580
V_W	1592								
VR	0.617								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1592 lc/h
Interchange density, ID	0.2 int/mi	Weaving lane changes, LC_W	1680 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	41 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1721 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	15

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2580 pc/h	Weaving intensity factor, W	0.428
Weaving segment capacity, c_w	3722 veh/h	Weaving segment speed, S	37.4 mph
Weaving segment v/c ratio	0.686	Average weaving speed, S_W	39.5 mph
Weaving segment density, D	23.0 pc/mi/ln	Average non-weaving speed, S_{NW}	34.4 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9226 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	NO-BUILD PM PEAK HOUR

Site Information

Freeway/Dir of Travel	EB
Weaving Segment Location	HIGHLAND AVENUE
Analysis Year	2025

Project Description *HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	3		
Weaving segment length, L_S	766ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	50 mph	Freeway maximum capacity, C_{IFL}	1900
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	519	0.92	1	0	1.5	1.2	0.995	1.00	567
V_{RF}	318	0.92	1	0	1.5	1.2	0.995	1.00	347
V_{FR}	500	0.92	1	0	1.5	1.2	0.995	1.00	546
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	567							V =	1460
V_W	893								
VR	0.612								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	893 lc/h
Interchange density, ID	0.2 int/mi	Weaving lane changes, LC_W	981 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	981 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	9

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1460 pc/h	Weaving intensity factor, W	0.275
Weaving segment capacity, c_w	3755 veh/h	Weaving segment speed, S	42.0 mph
Weaving segment v/c ratio	0.387	Average weaving speed, S_W	42.5 mph
Weaving segment density, D	11.6 pc/mi/ln	Average non-weaving speed, S_{NW}	41.2 mph
Level of Service, LOS	A	Maximum weaving length, L_{MAX}	9160 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	BUILD PM PEAK HOUR

Site Information

Freeway/Dir of Travel	EB
Weaving Segment Location	HIGHLAND AVENUE
Analysis Year	2025

Project Description *HIGHLAND AVE EB, FROM I-95 SB ON-RAMP TO I-95 NB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	3		
Weaving segment length, L_S	766ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	50 mph	Freeway maximum capacity, C_{IFL}	1900
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	550	0.92	1	0	1.5	1.2	0.995	1.00	601
V_{RF}	400	0.92	1	0	1.5	1.2	0.995	1.00	437
V_{FR}	500	0.92	1	0	1.5	1.2	0.995	1.00	546
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	601							V =	1584
V_W	983								
VR	0.621								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	983 lc/h
Interchange density, ID	0.2 int/mi	Weaving lane changes, LC_W	1071 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1071 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	9

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1584 pc/h	Weaving intensity factor, W	0.294
Weaving segment capacity, c_w	3728 veh/h	Weaving segment speed, S	41.4 mph
Weaving segment v/c ratio	0.423	Average weaving speed, S_W	42.0 mph
Weaving segment density, D	12.8 pc/mi/ln	Average non-weaving speed, S_{NW}	40.4 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9270 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	NO-BUILD AM PEAK PERIOD

Site Information

Freeway/Dir of Travel	SB
Weaving Segment Location	RT 128 SB C-D ROAD
Analysis Year	2025

Project Description *RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	2		
Weaving segment length, L_S	457ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	55 mph	Freeway maximum capacity, C_{IFL}	2350
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	934	0.92	3	0	1.5	1.2	0.985	1.00	1030
V_{RF}	344	0.92	3	0	1.5	1.2	0.985	1.00	380
V_{FR}	771	0.92	3	0	1.5	1.2	0.985	1.00	851
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	1030							V =	2261
V_W	1231								
VR	0.544								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1231 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1258 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	75 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1333 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	24

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2261 pc/h	Weaving intensity factor, W	0.526
Weaving segment capacity, c_w	3440 veh/h	Weaving segment speed, S	41.0 mph
Weaving segment v/c ratio	0.648	Average weaving speed, S_W	41.2 mph
Weaving segment density, D	27.6 pc/mi/ln	Average non-weaving speed, S_{NW}	40.7 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8351 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	BUILD AM PEAK PERIOD

Site Information

Freeway/Dir of Travel	SB
Weaving Segment Location	RT 128 SB C-D ROAD
Analysis Year	2025

Project Description *RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	2		
Weaving segment length, L_S	457ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	55 mph	Freeway maximum capacity, C_{IFL}	2350
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1030	0.92	3	0	1.5	1.2	0.985	1.00	1136
V_{RF}	350	0.92	3	0	1.5	1.2	0.985	1.00	386
V_{FR}	900	0.92	3	0	1.5	1.2	0.985	1.00	993
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	1136							V =	2515
V_W	1379								
VR	0.548								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1379 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1406 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	97 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1503 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	26

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2515 pc/h	Weaving intensity factor, W	0.578
Weaving segment capacity, c_w	3434 veh/h	Weaving segment speed, S	39.7 mph
Weaving segment v/c ratio	0.722	Average weaving speed, S_W	40.3 mph
Weaving segment density, D	31.6 pc/mi/ln	Average non-weaving speed, S_{NW}	39.0 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8397 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	NO-BUILD PM PEAK PERIOD

Site Information

Freeway/Dir of Travel	SB
Weaving Segment Location	RT 128 SB C-D ROAD
Analysis Year	2025

Project Description *RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	2		
Weaving segment length, L_S	457ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	55 mph	Freeway maximum capacity, C_{IFL}	2350
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	883	0.92	3	0	1.5	1.2	0.985	1.00	974
V_{RF}	497	0.92	3	0	1.5	1.2	0.985	1.00	548
V_{FR}	318	0.92	3	0	1.5	1.2	0.985	1.00	351
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	974							V =	1873
V_W	899								
VR	0.480								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	899 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	926 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	63 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	989 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	22

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1873 pc/h	Weaving intensity factor, W	0.416
Weaving segment capacity, c_w	3555 veh/h	Weaving segment speed, S	43.7 mph
Weaving segment v/c ratio	0.519	Average weaving speed, S_W	43.3 mph
Weaving segment density, D	21.5 pc/mi/ln	Average non-weaving speed, S_{NW}	44.0 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	7593 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP

FREEWAY WEAVING WORKSHEET

General Information

Analyst	CJ
Agency/Company	TT
Date Performed	7/30/2015
Analysis Time Period	BUILD PM PEAK PERIOD

Site Information

Freeway/Dir of Travel	SB
Weaving Segment Location	RT 128 SB C-D ROAD
Analysis Year	2025

Project Description *RT 128 NEW C-D ROAD SB, FROM HIGHLAND AVE WB ON-RAMP TO NEW C-D ROAD SB OFF-RAMP*

Inputs

Weaving configuration	One-Sided	Segment type	C-D Roadway/ Multilane Highways
Weaving number of lanes, N	2		
Weaving segment length, L_S	457ft	Freeway minimum speed, S_{MIN}	15
Freeway free-flow speed, FFS	55 mph	Freeway maximum capacity, C_{IFL}	2350
		Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	850	0.92	3	0	1.5	1.2	0.985	1.00	938
V_{RF}	500	0.92	3	0	1.5	1.2	0.985	1.00	552
V_{FR}	400	0.92	3	0	1.5	1.2	0.985	1.00	441
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	938							V =	1931
V_W	993								
VR	0.514								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	993 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1020 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	56 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1076 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	21

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1931 pc/h	Weaving intensity factor, W	0.444
Weaving segment capacity, c_w	3494 veh/h	Weaving segment speed, S	42.9 mph
Weaving segment v/c ratio	0.544	Average weaving speed, S_W	42.7 mph
Weaving segment density, D	22.5 pc/mi/ln	Average non-weaving speed, S_{NW}	43.2 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	7993 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".